

CRUISE DESIGN AND IMPLEMENTATION PLAN

**Davidson and Mill Creek
Timber Sale
Compartments 232, 228, 226, 225 and 212**



**USDA FOREST SERVICE
CHATTAHOOCHE-OCONEE NATIONAL FORESTS
CHATTOOGA RIVER RANGER DISTRICT**

Prepared by: John Westbrook

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Introduction:

The Davidson and Mill Creek Forest Health Thinnings are planned to improve forest health in timber stands located in Toccoa Pump Station and Currahee Mountain areas of Stephens County Georgia. The timber removal project is part of the Eastside Forest Health Pine Thinning Project authorized by the Eastside Environmental Assessment signed December 2010. The projects are located within Stephens County, Compartments 232, 228, 226, 225 and 212 of the Chattooga River Ranger District, 5+/- miles radius of Toccoa, Georgia. This cruise plan is for **332** +/- acres of thinning for forest health.

All stands (# 1 thru # 12) will be cut tree marked (CTM). Sample Tree cruising is planned for the estimated 332 +/- acres of the project (STR).

Access to the stands is generally good, accessed by maintained Forest Service system roads, County or State roads and temporary roads (not necessarily accessible by vehicular traffic). Terrain ranges from relatively flat ridge tops to moderately steep side slopes (0-30 percent slope) on all aspects.

Task 1: Layout and boundary marking of stand boundaries;

Task 2: Mapping of cutting unit boundaries with GPS; and

Task 3: Timber marking and/or cruising.

A detailed description of work is provided in the following sections. The following table provides some general information about each stand in the Davidson and Mill Creek Timber Sale project:

Compartment/ Stand	Stand Acres	Objective	Rx	# Units to Layout/Map/ Cruise/Mark	Cruise Method ^A	Timber Designation Method ^B
1. 232025	34	Forest Health	Thin	x	STR	CTM
2. 232013	14	Forest Health	Thin	x	STR	CTM
3. 225001	40	Forest Health	Thin	x	STR	CTM
4. 232034	7	Forest Health	Thin	x	STR	CTM
5. 232030	25	Forest Health	Thin	x	STR	CTM
6. 228022	34	Forest Health	Thin	x	STR	CTM
7. 228012	20	Forest Health	Thin	x	STR	CTM
8. 228004	26	Forest Health	Thin	x	STR	CTM
9. 228015	29	Forest Health	Thin	x	STR	CTM
10. 228028	40	Forest Health	Thin	x	STR	CTM
11. 226020	43	Forest Health	Thin	x	STR	CTM
12. 212039	20	Forest Health	Thin	x	STR	CTM
TOTAL	332					

^ASTR = 100 percent tally with sample trees..

Task 1: Layout and Boundary Marking Guidelines

(a) Stand Boundaries

The Davidson and Mill Creek Timber Sale project includes all or portions of 12 individual stands located across Compartments 232, 228, 226, 225 and 212. A Project map is attached and shows the estimated location of stand boundaries included in this project. Layout and boundary work shall be conducted in each individual stand that will be mapped under **Task 2** and marked/cruised under **Task 3** as described in this cruise/implementation plan.

All layout and boundary marking work will be performed in two (2) phases.

Phase 1: Crew shall physically locate stand boundary and flag its perimeter with high-visibility flagging.

Layout of cutting unit boundaries shall conform to the following standards and procedures:

- Layout shall not include areas with sustained slopes over 35 percent;
- Layout shall follow timber types (e.g. following pine boundary in first thinning units);
- Layout shall protect perennial and intermittent streams by establishing cutting unit boundaries no closer than 100 feet from identified perennial or intermittent streams.

Perennial streams are defined by the following: water flow is year round; streambed has a defined channel with exposed rock and riparian dependent flora and fauna.

Intermittent streams are defined by the following: evidence of water flow for part of the year; streambed has a defined channel with areas of exposed bedrock and areas of riparian dependent flora and fauna.

Upon verification of correct location of flagged boundaries, crew shall continue with **Phase 2** of the layout/boundary work.

Phase 3: Upon approval of flagged boundary, crew shall paint the flagged boundary of cutting units with **orange** tree marking tracer paint.

Painted boundaries shall conform to the following standards and procedures:

- Marked boundaries shall face into the unit;
- Boundaries will be marked with three (3) slanted slashes placed at 4 to 8 feet on the bole of trees and a butt mark painted on the downhill side of stump;

- Boundary slashes should be thick (2-3 inches) with ample amount of paint to remain visible for several years;
- Crew should select a mixture of tree sizes to use as boundary trees, but should avoid selecting non-desirable species such as Virginia pine, yellow poplar, white pine, and red maple, where practicable;
- Distances between boundary trees shall not exceed 50.
- If boundaries of two units are coincidental, ensure boundary paint is applied on both sides of selected boundary tree so that paint faces into units as described above.

(b)Layout of Special Areas and Protected Streamcourses

Crew shall be responsible for boundary layout and painting of special areas and other protection zones within project stands. These include Cultural Resource sites, Protected Plant sites, other special areas and Streamcourse Protection zones along streams on (1) interior of units (usually ephemeral streams which are defined by having water flow only after periods of precipitation) and (2) along cutting unit boundaries adjacent to streams where there is a perceived possibility that logging operations could otherwise carry over into such areas. Locations of Cultural Resource sites or other special areas requiring protection will be provided.

Layout and boundary painting of Cultural Resource sites, Protected Plant sites, and other special areas sites will conform to the following standards and procedures:

- Crew shall navigate to and locate sites and either (1)establish a white painted boundary (3 slashes and stump mark) around the perimeter of site(s) using tree marking tracer paint or (2) exclude from unit completely by altering unit boundary layout – site maps will be provided;
- In either case, the marked boundary shall be established at a minimum of 50 feet from the flagged location of the protected sites;
- White marked boundaries of protected site(s) shall face away from site and into matrix of cutting unit
- Distances between selected site boundary trees shall be no greater than 30 feet.

Layout of Streamcourse Protection zones shall conform to the following standards and procedures:

- Crew shall establish a pink painted boundary (3 slashes and stump mark) along both sides of designated Streamcourse Protection zones, when applicable, using tree marking tracer paint;
- Marked boundary shall be established 25 feet from ephemeral streams and 100 feet from perennial and intermittent streams, where applicable;
- When Streamcourse Protection zones are designated on interior of cutting units, marked boundary shall be placed on both sides of designated stream, at stated distances (above), facing away from the protected stream and into unit matrix – applicable for small ephemeral streams typically. When Streamcourse Protection zones are designated on exterior of unit (unit layout excluded the stream), painted

boundary shall be established at stated distances (above) and immediately behind orange painted stand boundary on applicable side of stream, facing away from stream (into unit) – **this should only be performed when there is a perceived possibility that logging operations could carry out of unit boundary and into riparian areas;**

- Distances between selected Protected Streamcourse zone boundary trees shall be no greater than 30 feet.

Task 2: Mapping Guidelines

(a)Boundary Mapping

Upon approval of actions (layout and painting) described in Task 1 (above), crew shall map delineated stand boundaries with GPS units.

GPS requirements:

A survey GPS unit must be used – NOT RECREATIONAL GRADE.

The GPS unit must have a minimum of 12 channel receiver.

An external antenna is recommended.

Data is to be collected in 3-D mode only.

A minimum PDOP of 6.

Horizon set at 15 degrees.

Data must be differentially corrected to <3 meter accuracy.

Data must be provided the Forest Service COR. Both uncorrected .ssf files and corrected .cor files. Files can be provided by e-mail attachments or on removable disks.

Task 3: Timber Marking/Cruising Guidelines

(a)Timber Designations

CTM with STR cruising – Stands 01-12

Cut Tree Marking (CTM) using Sample Tree cruise method is planned in 12 stands to form 5 cutting units established during **Tasks 1 and 2** described above. Trees designated for cutting (cut trees) will be marked with **blue** tree marking tracer paint at 2 locations –at about eye level and below stump height. A second face mark at about eye level should be applied on the opposite side of the initial mark on cut trees so that the paint designation is visible from all approaches. Stump marks shall be applied on the downhill side of tree, with sawtimber trees receiving two marks and pulpwood trees receiving one mark. Stump marks shall be placed so as to contact the soil surface and should extend 3-5 inches up the stump.

Cut trees will be 100% tallied by sample group with sample tree measurements. Detailed cruising instructions are provided in the **Cruise and Sampling Methods** section below.

All Units shall reduce tree density to an average of 60-70 ft² per acre.

(b)Cutting Unit Data

Cutting Unit	Payment Unit	Compt/ Stand	Cutting Unit Acres	Cruising Method	Designation Method	Unit Paint Color
01	01	212/039	20	STR	CTM	Blue
02	02	225/001	40	STR	CTM	Blue
	“	226/020	43	STR	CTM	Blue
03	03	228/022	34	STR	CTM	Blue
	“	228/028	40	STR	CTM	Blue
04	04	228/012	20	STR	CTM	Blue
	“	228/004	26	STR	CTM	Blue
	“	228/015	29	STR	CTM	Blue
05	05	232/013	14	STR	CTM	Blue
	“	232/025	34	STR	CTM	Blue
	“	232/030	25	STR	CTM	Blue
	“	232/034	7	STR	CTM	Blue
Total			332			

(c)Cruise Design

It is estimated that this sale will appraise for over \$50,000-\$75,000; therefore, sampling intensity was designed to meet a combined sampling error for the sale-as-a-whole of ± 16 percent. To achieve this level of accuracy, sampling errors were designed to meet a 15 percent error. Some minor adjustments were made based on historical observations from similar sales on the district. This design produced the following sampling intensities:

Strata	Sample Group	Species	Sample Interval
01 – CTM	YP (pine sawtimber 9.0” -13.9”)	131, 132	100
	WP (all white pine sawtimber)	129	1
	RM (sawtimber)	316	10
	YP (sawtimber)	621	10
	WO (sawtimber”)	802	10
	RO (sawtimber)	812 (all Red Oaks)	10
	LG (Low Grade Hardwood Sawtimber 12.0” +)	806, 400, 611, 693 & all HWD species w/ > Grade 3 log	20
	ZP (pine pulpwood 5”-8.9” – yellow pine; 5”-9.9” white pine)	110, 131, 132, 129, 261	100
	ZH (hardwood pulpwood 5”-11.9”)	All	50

(d)Cruise and Sampling Methods

1. STR cruising with cut tree marking (CTM) – +/- 332 acres:

Crew shall designate cut trees using blue tree marking tracer paint following **marking prescriptions (to be provided)**. Trees designated as “cut” trees by the crew will receive a complete (100%) tally with sample trees at intervals specified in the *STR cruising with cut tree marking (CTM) cruise design table* above (cruise data file will automate the sampling intervals specified in this table). The following cutting units will be cut tree marked (CTM) and sample tree cruised (STR):

Unit	Strata	Acres
All (1 – 5)	01	332
Total		332

Merchantability Specifications for STR with cut tree marking units:

Product	Min DBH (inches)	Min Tree Length (feet)	Sawtimber Height (feet)	Upper Reference Height (DOB) (feet)	Defect
White Pine/Hemlock Sawtimber	10.0	12	Height to significant defect with no “clear” 8 ft or greater section beyond	To 7 inch Dob	Percent of volume which cannot be utilized as a sawtimber product due to defect
Yellow Pine Sawtimber	9.0	12	Height to significant defect or unacceptable whorl with no “clear” 8 ft or greater section beyond	To 7 inch Dob	Percent of volume which cannot be utilized as a sawtimber product due to defect
Hardwood Sawtimber	12.0	12	Height to significant defect with no “clear” 8 ft or greater section beyond	To 9 inch Dob	Percent of volume which cannot be utilized as a sawtimber product due to defect
Pine Pulpwood	5.0	10	N/A	Total Height	N/A
Hardwood Pulpwood	5.0	10	N/A	Total Height	N/A

- Whorl = three or more limbs, limb stubs, or knots located within a one foot section along the main stem.
- Unacceptable Whorl = one in which the sum of the diameters of the limbs, limb stubs, or knots are equal to or greater than the diameter of the main stem at the location of the whorl.
- Significant defect = a canker, crook, sweep, swell, unacceptable whorl, fork, etc.

Every effort shall be made to retain naturally occurring desired species regeneration. Desired species are: shortleaf pine, pitch pine, all oaks, all hickories and black gum. Undesired or priority “cut” trees are loblolly pine, red maple, yellow poplar, sourwood, and white pine. Only leave undesirable trees when needed to make the target residual basal area. The target average residual basal area for these stands is 70. With that being said we are expecting to have some areas will be slightly higher than 70 BA while others may be in the 50- 60 BA range. Leave trees should only be dominant or co-dominant trees actively competing in the stand canopy (i.e. do not leave a 5” 20 ft. sub-dominant white oak and cut a 9” 50 ft. pine, when the oak is not actively competing).

Sample Tree Implementation

Crew will consist of the minimum of 1 tally person and 1 (or more) qualified cruiser(s)

1. Select logical starting point along unit boundary;
2. Cruiser(s) will begin designating cut trees following marking prescription and calling them out by sample group (i.e. P2, P6, P0, HS, ZP, or ZH). Tally person must “echo” information back to ensure the correct information is tallied. If tally person cannot hear the called out information, the cruiser must re-call out the information and then move closer to the tally person.
Tally person will tally trees as they are called, by sample group, until the FS Cruiser Program installed on the PDR (personal data recorder) prompts tally person to enter a sample. At this time, tally person will tell the cruiser who called out the tree to “sample that tree”. FS Cruiser allows trees to continue to be tallied while waiting for sample tree data to be entered.

Cruiser will measure sample tree and call out measurements to tally person and wait for “echo” back confirming the correct information was recorded.

3. Sample trees are to be identified with high visibility ribbon placed around the bole of the sample trees at about eye level.
4. On the “tail” of the ribbon, the following information is required: tree#, species code, dbh, sawtimber height (if a sawtimber tree), upper stem height (479 height), defect (sawtimber trees only), date, and cruiser’s initials. For example: #3, 131, 10.2, 35, 35, 0, 3/20/09, DS. This indicates the sample tree was: tree #3, loblolly pine, 10.2” dbh, 35’ sawtimber height, 35’ upper stem height (479 ht), zero percent defect, dated 3/20/09 by certified cruiser with the initials DS.

5. Sample trees are to be numbered consecutively, regardless of sample group/product group, starting with #1. Within each cutting unit, numbering of sample trees will always start with #1.

Note: Do not sample tree cruise/cut tree mark within equipment exclusion areas (Streamcourses: linear strips identified by pink paint - 3 slashes and stump mark along both sides of and facing away from defined channels; or Special Areas: polygon shaped areas identified by white paint - 3 slashes and a stump mark facing away from protected site) as volume in these areas will not be harvested during timber sale.

(e)Cruise Data Entry

FS Cruiser program will be used for cruise data entry.

The Cruise data file shall be set up to save to a SD card. A cruise file to load on the PDR device will be provided. The file will have the sample intervals specified by sample group built into set-up of the cruise data file for strata 01.

Make daily back-ups of cruise data to a PC with an organized file structure to minimize risk of data loss and for reference in cases of file corruption.

Inspection and Acceptance:

Check cruiser: The responsible qualified advanced cruiser is John Westbrook (Chattooga River Ranger District).

Check Cruise

Timber marking/cruising shall meet established marking and cruising standards.

The marking and cruising shall be check cruised to determine acceptable work. The Check Cruiser will document checks on R8-FS-2400-61 and R8-FS-2400-62. Form R8-FS-2400-63 will be used to evaluate overall satisfactory plot layout and marking.

Sample tree monumentation:

Each tree sampled for volume determination shall have high visibility flagging tied around the tree at eye-level. The cruiser shall write the information on the “tail” of the ribbon as listed in the table below. The tally person shall assure that the recorded documentation matches the painted number and cruiser initials.

Product	Tree Number	Species	DBH	¹ Ht 1	² Ht 479	Defect	Marker Initials
Pine Sawtimber	X	X	X	X	7	X	X
Hardwood Sawtimber	X	X	X	X	9	X	X
Pine Pulpwood (& Nonsaw)	X	X	X		Total Hgt.		X
Hardwood Pulpwood	X	X	X		Total Hgt.		X

¹ Ht 1 is the sawtimber merchantability limit

²These are the product reference heights for pine sawtimber (7 inches); hardwood sawtimber (9 inches); and for Pine and Hardwood pulpwood (total height).

Tracer Paint Accountability:

The security of tracer paint is of the utmost importance. It is one of the most important elements in use by the Forest Service to deter unauthorized cutting of federal timber.

The Forest Service, Chattahoochee National Forest has designated a Paint Property Custodian in accordance with direction in FSH 2409.12.

The Property Custodian is ultimately responsible for tracking all tracer paint, from the time it is ordered until proper disposal of the empty cans. An accounting system is in place to document the use and location of all full and empty tracer paint cans acquired by the district.

The Property Custodian will ensure that the all Forest Service employees involved in tree marking tracer paint exchange is trained in the procedures and importance of accountability. The Forest Service will insure that the sale preparation crew understands and is able to properly follow tracer paint accountability procedures and is aware of the importance of keeping paint secure.

Once a paint transaction has been checked for completeness and proper exchange, it shall be added to the inventory forms and secured in the crew's approved paint storage containers.

Paint Storage

The Paint Custodian or custodian's designee will pick up timber marking paint from the District paint storage facility. Timber marking paint shall be available for pickup at the district storage facility at 6:00 AM and shall be returned to the district storage facility no later than 5:30 PM, Monday through Friday. Timber marking paint will only be issued to the designated contractor paint custodian (CPC).

The CPC shall have the ability to secure the paint at all times while the paint is out of the Forest Service tracer paint storage facility.

Paint storage containers will be inspected and approved for compliance with security measures prior to paint being issued to the CPC. Storage containers shall be constructed of strong materials, with locking mechanisms that cannot be easily compromised. Containers must be anchored and have secured doors or lids with hinges to the inside or welded to prevent theft of the paint or the container.

Tracer paint containers will be locked at all times while not under direct surveillance of the contractor or his employees.

Tracer Paint Security While In the Field

Security of tracer paint is most vulnerable from the time it is checked out for field use, until it is returned and accounted for. It is extremely important during this time for the paint to be properly transported, stored, and used in the field.

All unused tracer paint shall be stored in secure – locked containers at all times.

Returning Unused Paint and Empty Cans to the COR

The CPC will return all unused paint and empty cans to the Forest Service paint custodian (FSPC) at the Forest Service secured paint storage facility on a daily basis.

All unused paint and empty cans will be returned to the FSPC at the Forest Service storage facility and accounted for by inventory methods. The CPC shall provide the FSPC with the required documentation, recorded on the Tree Marking Contractor's Daily Paint Accountability Log", prior to the COR approving any final Payment Invoice.

All individuals checking out tracer paint have the ability to secure the paint at all times while the paint is out of the Forest Service tracer paint storage facility. Tracer paint will not be issued to anyone who does not have the capability to secure the paint in the field. Tree marking paint will be stored in secure containers (building, vehicle, toolbox, etc.)

Paint storage containers will be inspected and approved for compliance with security measures prior to paint being issued to the contractor. Storage containers shall be constructed of strong materials, with locking mechanisms that cannot be easily compromised. Containers must be anchored (if applicable) and have secured doors, windows, and lids, with hinges to the inside or welded to prevent theft of the paint or the container itself.

Tracer paint containers will be locked at all times while not under direct surveillance of the contractor or his employees.

Lost Paint Procedure

An immediate investigation shall occur anytime tracer paint or empty tracer paint cans cannot be accounted for.

Paint Lost From Storage

Any time the inventory does not match the inventory sheets; check past and present inventory sheet figures in an effort to locate a possible math error or where the discrepancy occurred. If the paint cannot be accounted for:

1. Immediately perform a complete audit of all paint in storage, including paint stored in vehicles. If procedures have been followed, this audit should identify the person who lost the paint or verify that a theft has occurred from the paint storage facility.
2. If a theft from the storage area is indicated, immediately notify the COR.
3. The Paint Custodian or custodian's designee and Property Custodian will prepare separate written statements. The Property Custodian will notify the District Ranger and District Law Enforcement Officer. All written documentation will be submitted for review.

Paint Lost in the Field

If all tracer paint cans are not accounted for at the end of the day:

1. An immediate inventory will be conducted to determine which employee lost the paint.
2. Prior to the crew leaving the area, a search will be conducted of the area in which the employee was working.

If the paint is not found:

1. The Paint Custodian or custodian's designee will provide a written statement addressing the circumstances involved in the loss. Statements involving lost tracer paint must
Include the following information:

Brand of paint (manufacturer)
Batch number
Date of manufacture
Color of paint
Type of can (quart, aerosol etc.)
Was the can(s) full, partially full, or empty
Circumstances and Location of loss

If lost on a timber sale, Paint Custodian or custodian's designee will include all information in the presale or administration folder as appropriate.

2. The Paint Custodian or custodian's designee will immediately notify the Property Custodian. The Property Custodian will notify the District Ranger and District Law Enforcement Officer as soon as possible.

3. Upon review of documentation provided, the District Law Enforcement Officer will determine investigation procedures.

SPECIAL INSTRUCTIONS:

SAFETY: All Forest Service Personnel working on this assignment shall review the health and safety code handbook as well as the Job Hazard Analysis (JHA) for timber marking and cruising. Tail Gate safety meetings will be held a minimum of weekly and whenever weather or field conditions vary. These sessions shall be documented and copies of those in attendance noted and filed in the pre-sale folder. The sign-out tracking sheet shall be used. A review of the JHA pertaining to communication and tracking shall be reviewed and discussed in tailgate sessions as well as the JHA for marking and cruising.

PAINT SECURITY: To prevent unauthorized use of Forest Service tracer paint, take measures to safeguard the tracer paint. Specifically, do not leave tracer paint in unlocked vehicles or storage areas.

DOCUMENTATION:

Forest Service Personnel:

The unit paint usage forms will have daily entries for paint usage and will be submitted to the TMA upon completion of the project.

A daily recording of the units cruised, number of plots taken, approximate percentage of units marked, crew names, number of hours spent on the project, including travel time, as well as field observations, shall be kept daily and submitted to the TMA to assist in determining production, paint usage by designation method and for other planning purposes.

CHECK CRUISE: The District check cruiser shall place copies of the check cruise in the pre-sale folder as well as copies of records for hot and/or cold checks for the certified cruisers on this sale.

see Attachments

100 Other Softwoods	601 Butternut
107 Sand Pine	602 Black Walnut
110 Shortleaf Pine	611 Sweetgum
111 Slash Pine	621 Yellow-poplar
115 Spruce Pine	650 Wahoo
121 Longleaf Pine	651 Cucumbertree
123 Table Mt Pine	652 Magnolia
126 Pitch Pine	653 Sweetbay
128 Pond Pine	691 Water Tupelo
129 White Pine	693 Blackgum (highland)
131 Loblolly Pine	694 Blackgum (lowland)
132 Virginia Pine	711 Sourwood
197 Spruce	731 Sycamore
221 Baldcypress	742 Cottonwood
222 Pondcypress	762 Black Cherry
261 Hemlock	800 Oak (Mixed)
268 Eastern Redcedar	802 White Oak
300 Soft Hardwoods	813 Cherrybark Oak
313 Boxelder	817 Shingle Oak
314 Black Maple	820 Laurel Oak
316 Red Maple	822 Overcup Oak
317 Silver Maple	823 Bur Oak
318 Sugar Maple	825 Swamp Chestnut Oak
330 Buckeye	826 Chinkapin Oak
370 Birch (except yellow)	804 Swamp White Oak
400 Hickory	806 Scarlet Oak
404 Pecan	812 Southern Red Oak
460 Hackberry	827 Water Oak
500 Hard Hardwoods	828 Nuttall Oak
521 Persimmon	830 Pin Oak
531 Beech	831 Willow Oak
541 Ash, White	832 Chestnut Oak
544 Ash, Green	833 Northern Red Oak
545 Ash, Pumpkin	834 Shumard Oak
546 Ash, Blue	835 Post Oak
550 Honey Locust	837 Black Oak
580 Silverbell	901 Black Locust
	920 Willow
	930 Sassafras
	950 Basswood
	970 Elm

Percent of Tree Product Volume by 16-Foot Logs Small Cubic Volume												
		Log Number										
MERCH HT. 1/ (6ft)	LOG HT.	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
12-20	1	100										
21-28	1.5	78	22									
29-36	2	63		37								
37-44	2.5	58		33	9							
45-52	3	45		33		22						
53-60	3.5	45		33		19	3					
61-68	4	37		28		21		14				
69-76	4.5	36		27		21		13	3			
77-84	5	32		25		19		15		9		
85-94	5.5	30		24		19		15		9	3	
95-102	6	27		22		19		14		11		?
1/ Ht. total tree height												
When volume estimates are based on measuring entire stem length to a specified reference diameter and it becomes necessary to reduce merchantable length because of defect, express this as a percentage deduction from tree volume, rather than by tallying the tree as being shorter than it is.												
Adapted from FSH 22.31a - exhibit 02												

Calculator																
Defect% in 16' log and feet	0%	12%	19%	25%	31%	38%	44%	50%	56%	62%	69%	75%	81%	88%	94%	100%
	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'
% of Tree Prod Vol																
3%	-	-	1	1	1	1	1	2	2	2	2	2	2	2	2	3
7%	-	1	1	2	2	2	3	4	4	4	4	5	6	6	6	7
9%	1	1	2	2	2	3	4	4	5	6	6	6	7	8	8	9
11%	1	1	2	2	3	4	4	6	6	6	8	8	8	10	10	11
13%	1	2	2	3	4	4	6	6	7	8	8	10	11	11	12	13
14%	1	2	2	4	4	5	6	7	8	8	10	11	11	12	13	14
15%	1	2	2	4	4	6	6	8	8	9	10	11	12	13	14	15
19%	1	2	4	4	6	7	8	10	11	12	13	14	15	16	18	19
21%	1	2	4	5	6	8	9	11	12	13	14	16	17	18	20	21
22%	1	2	4	6	6	8	10	11	12	14	15	16	18	19	21	22
24%	1	2	4	6	7	9	11	12	13	14	16	18	19	21	22	24
25%	2	3	4	6	8	10	11	12	14	15	17	18	20	22	24	25
27%	2	3	5	6	8	10	12	14	15	16	18	20	22	24	25	27
28%	2	3	5	7	8	11	12	14	16	17	19	21	22	24	26	28
30%	2	4	6	8	9	11	13	15	17	19	21	23	24	26	28	30
32%	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32
33%	2	4	6	8	10	12	14	16	18	20	22	24	26	29	31	33
36%	2	5	7	9	11	14	16	18	20	23	25	27	29	32	34	36
37%	2	4	7	9	11	14	16	18	21	22	26	28	30	32	34	37
45%	2	5	8	11	14	17	20	22	25	28	31	34	36	40	42	45
58%	4	7	11	15	18	22	25	29	33	36	40	44	47	51	54	58
63%	4	8	12	16	20	24	28	32	35	39	43	47	51	55	59	63
78%	5	10	15	19	24	29	34	39	44	49	54	58	63	68	73	78
Defect% in 8' log and feet	1'	2'	3'	4'	5'	6'	7'	8'								
	12%	25%	38%	50%	62%	75%	88%	100%								

by John Stone - HP's in Texas - March 1998

Tree Marking Tracer Paint Field Accountability Log

Daily tracer paint use by unit, color and batch

Sale Name_____

Purpose:	Layout
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Marking Streamcourses

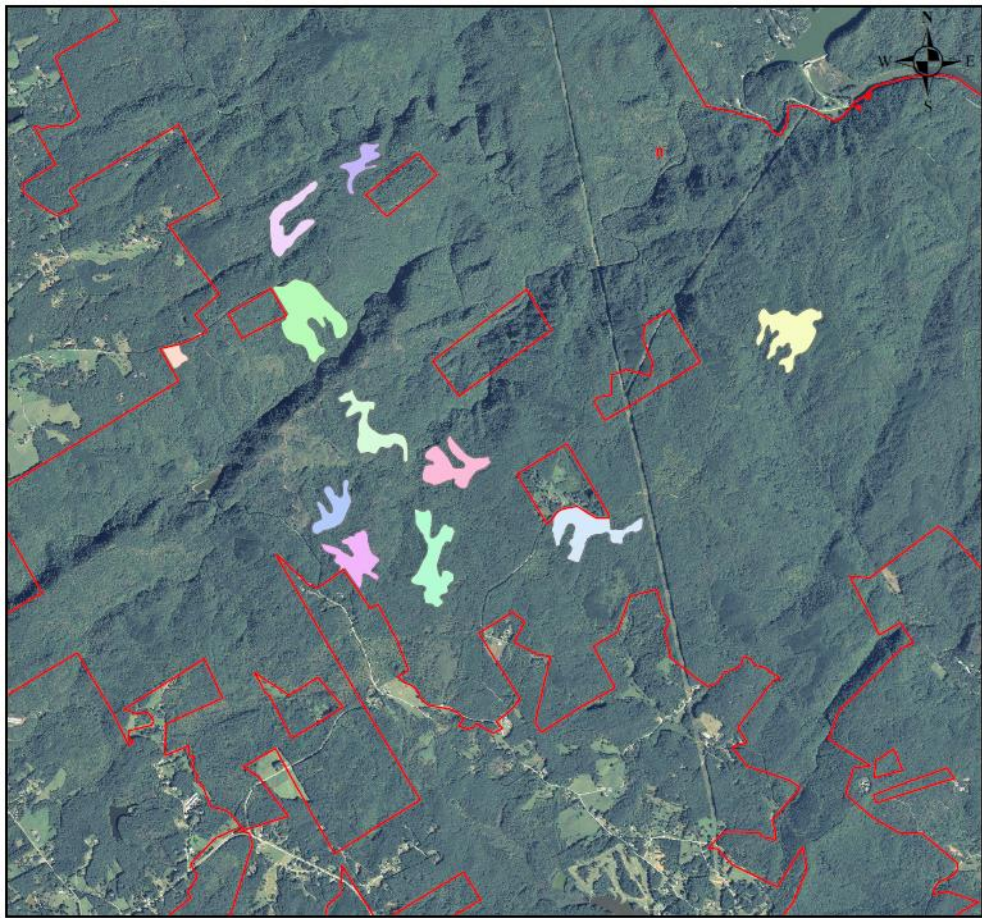
Special Areas (circle one)

[illegible]


*Use separate table for marking, layout, and/or Special Areas and Streamcourses

Davidson and Mill Creek Proposed Timber Sale

NORTHERN PORTION OF SALE AREA Stand Location and Proximity




Legend

 Chattahoochee_Oconee_NF_Blob

Davidson Creek Area Stands

CS

 225001

 226020

 228004

 228012

 228015

 228022

 228028

 232013

 232025

 232030

 232034

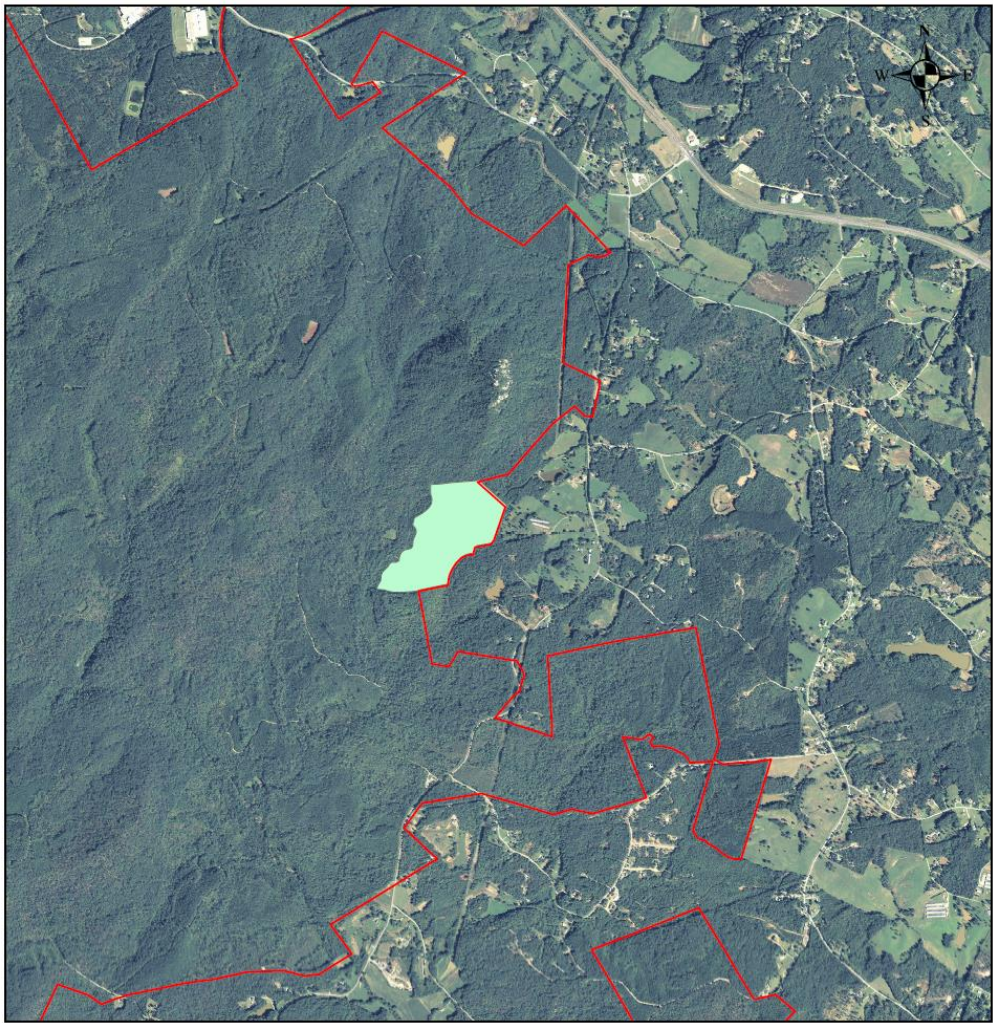


0 0.25 0.5 1 1.5 2 Miles


Westbrook 7/21/2014

Davidson and Mill Creek Proposed Timber Sale


SOUTHERN PORTION OF SALE AREA Stand Location and Proximity




Legend

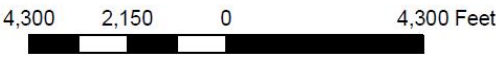
 NF Boundary

Mill Creek Stand Location

 <all other values>

CS

 212039



Westbrook 7/21/2014